REMARKS

Present Status of Application

The Office Action dated December 09, 2004, objected the specification and claims 1-17 for informalities. Claims 1-2, 5-8, 10, 13-17 were rejected under the judicially created doctrine of obviousness type double patenting as being unpatentable over claims 1-7 of US Patent No. 6,825,568, filed September 01, 2003, entitled "Flip Chip Package Structure And Flip Chip Device with Area Bump". Claims 1-6 were rejected under 35 USC§102(e) as being anticipated by Hsu et al. (US Patent No. 6,774,498). Claims 1-3, 5-6, 8-15 and 17 were rejected under 35 USC§102(b) as being anticipated by Andrews (US Patent No. 5,352,926). Claim 16 was rejected under 35 USC§103(a) as being unpatentable over Andrews.

Claims 1 and 15-16 have been amended for correcting informalities and providing correct dependency, while claims 8-14 and 17 have been cancelled. No new matter has been added to the application by the amendments made to the specification, claims and drawings. This Amendment is promptly filed to place the above-captioned case in condition for allowance. After entering the amendments and considering the following discussions, a notice of allowance is respectfully solicited.

Discussion for the objections

The specification was objected for incorrect fonts.

In response to this objection, the Applicant respectfully points out that the specification of this application was filed through e-filing system and the font of this

specification is in compliance with the regulations of the e-filing system.

Claims 1-17 were objected for having printed lines across the claim pages when faxed to the Office.

In response to this objection, the Applicant respectfully points out that the amendment of the claims for this application filed on November 09, 2004 were faxed to the Office without printed lines. However, it is possible that certain stains were produced during the faxing process. For your convenience of examination, a clean copy of this amendment of the claims for this application filed on November 09, 2004 is enclosed again for your examination.

The Office Action considered that the phrase "but not" of claims 5 and 13 not appropriate.

Applicant respectfully disagrees with this consideration. Applicant believes the scopes of the claims are well and clearly defined by the phrase "physically but not electrically connected", even the term "not" is present in the claims. It is noted that negative connotations may not be appropriate for the claims only if the scope of the claims were poorly defined by the negative connotations

Withdrawal of these objections is respectfully requested.

Discussion of double patenting rejections

Claims 1-2, 5-8, 10, 13-17 were rejected under the judicially created doctrine of obviousness type double patenting as being unpatentable over claims 1-7 of US Patent No. 6,825,568, filed September 01, 2003, entitled "Flip Chip Package Structure And Flip

Chip Device with Area Bump".

Claims 8-14 and 17 have been cancelled. Applicant believes that the claimed invention recited in claims 1-2, 5-7, 15-16 can distinguish over claims 1-7 of US Patent No. 6,825,568. As recited in the claims 1-2, 5-7, 15-16 of this application, the flip chip package structure comprising at least a chip with a first bumping region, a substrate with a second bumping region that includes at least a first hole and a plurality of second holes, at least a first bump and a plurality of second bumps. However, as disclosed in claims 1-7 of US Patent No. 6,825,568, the structure includes a chip, (a substrate), a plurality of first bumps and at least a second bump, wherein the size of the second bump is larger than that of the first bump and the first bumps are disposed at a periphery of the second bump. Obviously, the scopes of claims 1-7 of US Patent No. 6,825,568 are different from those of claims 1-2, 5-7, 15-16 of this application and claims 1-7 of US Patent No. 6,825,568 fail to disclose all the elements as recited in the claims 1-2, 5-7, 15-16 of this application. For example, no teachings related to the first or second holes are taught or suggested in claims 1-7 of US Patent No. 6,825,568.

As recited in MPEP 804 II.- B.- 1. "Obviousness-type", "Any obviousness-type double patenting rejection should make clear:

(A) The differences between the inventions defined by the conflicting claims — a claim in the patent compared to a claim in the application; and

(B) The reasons why a person of ordinary skill in the art would conclude that the invention defined in the claim in issue is an obvious variation of the invention defined in a claim in the patent. "

Clearly, the Office Action should provide appropriate rationale of obviousness for

any claims being rejected over the claims of the cited reference.

According to the Office Action, even considering interchanging the terms "first" and "second", claims 1-7 of US Patent No. 6,825,568 still fail to disclose all the features as recited in the claims 1-2, 5-7, 15-16 of this application, and no reasonable rational is provided for why, to one skill in the art, this application having different features and scopes is an obvious variation of US Patent No. 6,825,568.

As a result, reconsideration and withdrawal of these rejections are respectfully requested.

Discussion for 35 USC§102 and 103 rejections

Claims 1-6 were rejected under 35 USC§102(e) as being anticipated by Hsu et al. (US Patent No. 6,774,498). Claims 1-3, 5-6, 8-15 and 17 were rejected under 35 USC§102(b) as being anticipated by Andrews (US Patent No. 5,352,926). Claim 16 was rejected under 35 USC§103(a) as being unpatentable over Andrews.

The Office Action considered that either Hsu et al. or Andrews substantially disclosed this invention.

Claims 8-14 and 17 have been cancelled. Claims 1 and 15-16 have been amended for correction purposes.

Applicants submit that independent claim 1 patently defines over the prior references for at least the reason that the cited art fails to disclose each and every feature as claimed in the present invention.

The independent claim 1 recites:

1. A flip chip package structure, comprising:
a chip having a first bump-positioning region;
a substrate having a second bump-positioning region, at least a first hole and a plurality of second holes, wherein the first hole and the second holes are located within the second bump-positioning region, and the first hole has a depth greater than the second holes;
at least a first bump arranged between the first bump-positioning region of the chip and the second bump-positioning region of the substrate, wherein the first bump and the substrate are bonded together via the first hole; *and*
a plurality of second bumps arranged between the first bump-positioning region of the chip and the second bump-positioning region of the substrate, wherein the second bumps and the substrate are bonded together via the second holes;
wherein the first bump has a volume larger than a volume of the second bump

Applicant respectfully asserts that claim 1 is patentably distinct from the prior art structures, especially at least a first bump arranged between the first bump-positioning region of the chip and the second bump-positioning region of the substrate, wherein the first bump and the substrate are bonded together via the first hole; and a plurality of second bumps arranged between the first bump-positioning region of the chip and the second bump-positioning region of the substrate, wherein the second bumps and the substrate are bonded together via the second holes.

Hsu discloses a package structure including a die 10 connected to the chip package substrate 30 through bumps 20, and a plurality of balls 40 connected to the chip package substrate 30. From Fig. 1, it clearly shows that balls 40 are disposed on the other side of the chip package substrate 30, rather than disposed between the die 10 and the chip package substrate 30.

The Office Action considered Hsu's balls 40 and bumps 20 comparable to the first and second bump of this application. Applicant respectfully disagrees with this consideration.

Even considering Hsu's bumps 20 between the die 10 and the chip package substrate 30 being comparable to the second bump of this invention, Hsu fails to disclose or mention a first bump arranged between the first bump-positioning region of the chip and the second bump-positioning region of the substrate, as recited in claim 1. Hsu also fails to disclose the first bump-positioning region of the chip, the second bump-positioning region of the substrate or the first and second holes of the substrate.

Accordingly, the structure of the present invention is patentably distinct from the prior art reference Hsu because Hsu fails to disclose all limitations of claim 1.

Andrews merely discloses a flip chip package structure having a die 30 bonded to the flexible dielectric material 20 and bonded to a heat sink (base plate) 10. A portion of the flexible dielectric material 20 is removed to form openings 22. The die 30 is rigidly connected to the base plate 10 through bump 32 (along with conductive layer 27, conductive region 23 and 28). The conductive region 23 and 28 are disposed between the flexible dielectric material 20 and the base plate 10, as shown in Fig. 1.

The Office Action considered Andrews's based plate 10, openings 22, structure 32/23/28 and 23/28 respectively comparable to the substrate, the first and second holes, the first and second bump of this application. Applicant respectfully disagrees with this consideration.

At first, even considering Andrew's base plate 10 was comparable to the substrate of this invention, the openings 22 are formed in the flexible dielectric material 20, rather than in the base plate 10. Similarly, Andrews fails to disclose or mention the first bump arranged between the first bump-positioning region of the chip and the second

bump-positioning region of the substrate, wherein the first bump and the substrate are bonded together via the first hole, as recited in claim 1.

Accordingly, the structure of the present invention is patentably distinct from the prior art reference Andrews because Andrews fails to disclose all limitations of claim 1.

As a result, neither Hsu nor Andrews anticipates the present invention as suggested by the Office Action, to arrive at the present invention as recited in independent claim 1. For at least the foregoing reasons, all pending claims patently define over the cited reference and should be allowed.

Consequently, reconsideration and withdrawal of these 102 rejections are respectfully requested.

Claim 16 has been amended to depend on independent claim 1.

Accordingly, the structure of the present invention is patentably distinct from the prior art reference because Andrews fails to disclose all limitations of independent claim 1. Therefore, it is respectfully submitted that claim 16 patentably distinguishes over the cited reference Andrews, either alone or in combination, for at least the reasons stated above as well as for the additional features that this claim recites.

Withdrawal of these rejections under 35 USC 103(a) is respectfully requested.

CONCLUSION

In view of the foregoing, it is believed that all pending claims are in proper condition for allowance. If the Examiner believes that a telephone conference would expedite the examination of the above-identified patent application, the Examiner is invited to call the undersigned.

Respectfully submitted,

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